

Serial No.: 10/811,763
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Examiner: J.D. Zimmerman
Art Unit: 2854

CLAIMS

1. (currently amended) A thermal developing apparatus for removing non-crosslinked polymer from an imaged surface of a cylindrical flexographic printing element, the thermal developing apparatus comprising:

at least one two heatable roll rolls that is are contactable with an imaged surface of a the flexographic printing element; and

means for maintaining contact between the at least one two heatable roll rolls and the imaged surface of the flexographic printing element,

wherein when the at least one two heatable roll rolls are heated and moved is heated and is moved over at least a portion of the imaged surface of the flexographic printing element, non-crosslinked polymer on the imaged surface of the flexographic printing element is melted and removed by the at least one two heatable roll rolls, and wherein the at least two heatable rolls are opposably positioned adjacent and apart from each other and are each maintainable in contact with the imaged surface of the flexographic printing element, and wherein when the at least two heatable rolls are contacted with the imaged surface of the flexographic printing element, the at least two heatable rolls are self centering against the imaged surface of the flexographic printing element.

2. (currently amended) The thermal developing apparatus according to claim 1, wherein a blotting material is positioned on at least a portion of the at least one two heatable roll rolls, and wherein when the at least one two heatable roll rolls is are heated and is are contacted with the imaged surface of the flexographic printing element, non-crosslinked polymer on the imaged surface of the flexographic printing element is melted by the heated roll rolls and is removed by the blotting material.

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3. (currently amended) The thermal developing apparatus according to claim 2, wherein the blotting material is looped under and around at least the portion of the at least one two heatable roll rolls that contacts contact the imaged surface of the flexographic printing element.

4. (currently amended) The thermal developing apparatus according to claim 3, wherein the blotting material is continuously supplied to the at least one two heatable roll rolls from a remote source of the blotting material.

5. (previously presented) The thermal developing apparatus according to claim 3, further comprising a rewind device to carry away the blotting material that contains the removed non-crosslinked polymer.

6. (previously presented) The thermal developing apparatus according to claim 2, wherein the blotting material is paper.

7. (currently amended) The thermal developing apparatus according to claim 1, further comprising a doctor blade that is positionable adjacent to the at least one of the at least one two heatable roll rolls, and wherein when the at least one heatable roll removes non-crosslinked polymer from the imaged surface of the flexographic printing element, the doctor blade wipes the non-crosslinked polymer from the surface of the at least one heatable roll.

8. (currently amended) The thermal developing apparatus according to claim 1, wherein the means for maintaining contact between the at least one two heatable roll rolls and the imaged surface of the flexographic printing element comprises an air cylinder or a hydraulic cylinder that forces the at least one two heatable roll rolls against the imaged surface of the flexographic printing element.

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9. (cancelled)

10. (cancelled)

11. (currently amended) The thermal developing apparatus according to claim 10 1, wherein the at least one two heatable roll rolls rotates rotate in a first direction and the cylindrical flexographic printing element rotates in an opposite direction from the at least one two heatable roll rolls.

12. (currently amended) The thermal developing apparatus according to claim 9 1, further comprising means for allowing the at least one two heatable roll rolls to traverse along the length of the cylindrical flexographic printing element.

13. (cancelled)

14. (cancelled)

15. (cancelled)

16. (cancelled)

17. (cancelled)

18. (cancelled)

19. (cancelled)

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20. (currently amended) The thermal developing apparatus according to claim 19 1, wherein a blotting material is continuously fed to the at least two heatable rolls by looping the blotting material under and around at least the portion of the first heatable roll that is contactable with the imaged surface of the flexographic printing element, looping the blotting material around one or more track rolls positioned between apart from the two heatable rolls, and then looping the blotting material under and around at least the portion of the second heatable roll that is contactable with the imaged surface of the flexographic printing element.

21. (currently amended) The thermal developing apparatus according to claim 20 1, further comprising one or more additional heatable rolls that are positionable in an opposing position on an opposite side of the cylindrical flexographic printing element, wherein the one or more additional heatable rolls are maintainable in contact with at least a portion of the imaged surface of the flexographic printing element.

22. (cancelled)

23. (currently amended) A method of removing non-crosslinked polymer from an imaged surface of a cylindrical flexographic printing element with at least one two heatable roll rolls, the method comprising:

- a) heating the at least one two heatable roll rolls;
- b) causing contact between the at least one two heated roll rolls and the imaged surface of the flexographic printing element; and
- c) rotating the at least one two heated roll rolls against at least a portion of the imaged surface of the flexographic printing element to melt and remove non-crosslinked photopolymer from the imaged surface of the flexographic printing element; wherein the at least two heatable rolls are opposably positioned adjacent and apart from each other and are each maintained in contact with the imaged surface of the flexographic

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printing element and wherein when the at least two heatable rolls are contacted with the imaged surface of the flexographic printing element, the at least two heatable rolls are self centering against the imaged surface of the flexographic printing element.

24. (currently amended) The method according to claim 23, wherein the at least one heated ~~roll~~ traverses rolls traverse the length of the ~~cylindrical~~ flexographic printing element.

25. (currently amended) The method according to claim 24, wherein the at least ~~one~~ two heated ~~roll~~ traverses rolls traverse the length of the flexographic printing element multiple times until all of the non-crosslinked polymer is removed from the imaged surface of the flexographic printing element.

26. (currently amended) The method according to claim ~~25~~ 24, wherein the at least ~~one~~ two heated ~~roll~~ traverses rolls traverse the length of the ~~cylindrical~~ flexographic printing element in a spiral or stepwise manner.

27. (currently amended) The method according to claim 23, wherein the at least ~~one~~ two heated ~~roll~~ rotates rolls rotate in a first direction and the ~~cylindrical~~ flexographic printing element rotates in an opposite direction from the at least ~~one~~ heated ~~roll~~ two heated rolls.

28. (currently amended) The method according to claim 23, wherein an air cylinder or a hydraulic cylinder is used to maintain contact between the at least ~~one~~ two heated ~~roll~~ rolls and the imaged surface of the flexographic printing element.

29. (currently amended) The method according to claim 23, wherein at least the portion of the at least ~~one~~ two heated ~~roll~~ rolls that is are in contact with the imaged

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surface of the flexographic printing element is covered with a blotting material and the blotting material removes the non-crosslinked polymer from the imaged surface of the flexographic printing element.

30. (currently amended) The method according to claim 29, wherein the blotting material is looped under and around at the least the portion of the at least one two heated roll rolls that is are in contact with the imaged surface of the flexographic printing element.

31. (currently amended) The method according to claim 30, wherein the blotting material is continuously fed to the at least one two heated roll rolls from a remote source of the blotting material.

32. (previously presented) The method according to claim 31, wherein the blotting material that contains the removed non-crosslinked photopolymer is rewound onto a rewind device.

33. (previously presented) The method according to claim 29, wherein the blotting material comprises paper.

34. (currently amended) The method according to claim 23, wherein the non-crosslinked polymer remaining on the at least one two heated roll rolls after removal from the imaged surface of the flexographic printing element is removed from the at least one two heated roll rolls by positioning a doctor blade adjacent to the at least one one of the two heated roll rolls to wipe the non-crosslinked polymer from the surface of the at least one heated roll thereof.

35. (cancelled)

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36. (currently amended) The method according to claim 35 23, wherein the blotting material is continuously fed to the at least two heated rolls by wrapping blotting material around at least the portion of the first heated roll that is in contact with the imaged surface of the flexographic printing element, looping the blotting material around one or more track rolls positioned between apart from the at least two heated rolls, and then wrapping the blotting material around at least the portion of the second heated roll that is in contact with the imaged surface of the flexographic printing element.

37. (currently amended) The method according to claim 35 23, wherein one or more additional heated rolls are positioned in an opposing position on an opposite side of the cylindrical flexographic printing element and maintained in contact with at least a portion of the imaged surface of the flexographic printing element.

38. (currently amended) The method according to claim 23, wherein the at least one two heated roll is rolls are maintained at a temperature of about 350 °F to about 450 °F.

39. (New) A thermal developing apparatus for removing non-crosslinked polymer from an imaged surface of a flexographic printing element, the thermal developing apparatus comprising:

- (a) at least two heatable rolls that are contactable with the imaged surface of the flexographic printing element; and
- (b) means for maintaining contact between the at least two heatable rolls and the imaged surface of the flexographic printing element;

wherein when the at least two heatable rolls are heated and moved over at least a portion of the imaged surface of the flexographic printing element, non-crosslinked polymer on the imaged surface of the flexographic printing element is melted and

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removed and wherein at least two heatable rolls are positioned opposing each other on opposite sides.

40. (New) A method of removing non-crosslinked polymer from an imaged surface of a flexographic printing element with at least two heatable rolls, the method comprising:

- (a) heating the at least two heatable rolls;
- (b) causing contact between the at least two heatable rolls and the imaged surface of the flexographic printing element; and
- (c) rotating the at least two heatable rolls against at least a portion of the imaged surface of the flexographic printing element to melt and remove non-crosslinked polymer from the imaged surface of the flexographic printing element;

wherein the at least two heatable rolls are positioned opposing each other on opposite sides.

41. (New) A method according to claim 40 wherein the at least two heatable rolls traverse the length of the flexographic printing element.

42. (New) A method according to claim 41 wherein the at least two heatable rolls traverse the length of the flexographic printing element in a spiral or stepwise manner.

43. (New) A thermal developing apparatus for removing non-crosslinked polymer from an imaged surface of a flexographic printing element, the thermal developing apparatus comprising;

- (a) at least two heatable rolls that are contactable with the imaged surface of the flexographic printing element

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- (b) means for maintaining contact between the at least two heatable rolls and the imaged surface of the flexographic printing element; and
- (c) a means for continuously supplying blotting material to the at least two heatable rolls by wrapping the blotting material around at least a portion of the first heatable roll, looping the blotting material around one or more track rolls positioned apart from the at least two heatable rolls, and then wrapping the blotting material around at least a portion of the second heatable roll.

wherein when the at least two heatable rolls are heated and moved over at least a portion of the imaged surface of the flexographic printing element, non-crosslinked polymer on the surface of the flexographic printing element is melted and removed.

44. (New) A method of removing non-crosslinked polymer from an imaged surface of a flexographic printing element with at least two heatable rolls, the method comprising:

- (a) heating the at least two heatable rolls;
- (b) continuously supplying blotting material to the at least two heatable rolls by wrapping the blotting material around a least a portion of the first heatable roll, looping the blotting material around one or more track rolls positioned apart from the at least two heatable rolls, and then wrapping the blotting material around at least a portion of the second heatable roll;
- (c) causing contact between the at least two heatable rolls and the imaged surface of the flexographic printing element; and
- (d) rotating the at least two heatable rolls against at least a portion of the imaged surface of the flexographic printing element to melt and remove non-crosslinked polymer from the imaged surface of the flexographic printing element.

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45. (New) A thermal developing apparatus for removing non-crosslinked polymer from an imaged surface of a flexographic printing element, the thermal developing apparatus comprising:

- (a) at least one heatable roll that is contactable with the imaged surface of the flexographic printing element;
- (b) means for causing the at least one heatable roll to traverse the imaged surface of the flexographic printing element in a spiral or stepwise manner;
- (c) means for maintaining contact between the at least one heatable roll and the imaged surface of the flexographic printing element;

wherein when the at least one heatable roll is heated and moved over at least a portion of the imaged surface of the flexographic printing element, non-crosslinked polymer on the surface of the flexographic printing element is melted and removed.

46. (New) An apparatus according to claim 45 also comprising a means for supplying blotter material to the at least one heatable roll such that the blotter material passes between the at least one heatable roll and the imaged surface of the flexographic printing element.

47. (New) A method of removing non-crosslinked polymer from an imaged surface of a flexographic printing element, said method comprising:

- (a) heating at least one heatable roll;
- (b) causing contact between the at least two heatable rolls and the imaged surface of the flexographic printing element;
- (c) causing the at least one heatable roll to traverse the imaged surface of the flexographic printing element in a spiral or stepwise manner;

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wherein non-crosslinked polymer is removed from the imaged surface of the flexographic printing element.

48. (New) A method according to claim 47 wherein the method further comprises supplying blotting material to the at least one heatable roll such that the blotting material passes between the at least one heatable roll and the imaged surface of the flexographic printing element.